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Key Debt-Troubled LDCs: Export Response to OECD Recovery

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An Intelligence Assessment

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An Intelligence Assessment

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**Key Debt-Troubled LDCs:
Export Response to
OECD Recovery**

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Key Judgments

*Information available
as of 12 July 1983
was used in this report.*

Perhaps the key factor behind the financial problems of the debt-troubled LDCs has been the recent falloff in their exports caused by the recession in the OECD. LDC exports have failed to keep pace with import demands, leading to the continued debt buildup since 1980. Depressed export levels, moreover, have made it increasingly difficult for many LDCs to service these higher debt levels.

While the OECD economic recovery should reverse the declines in LDC exports, we do not believe that, by itself, it will be sufficient to solve their financial difficulties, at least not by the middle of the decade. We believe that the lagged response of LDC exports to an OECD economic turnaround will severely limit the export rebound this year. Further, we estimate that the export gains in 1984-85 will not match the export growth of the 1970s. Indeed, it would take a very rapid OECD recovery—on the order of 5 percent a year—to help LDCs regain their prerecession export growth rates.

LDC exports have in the past lagged OECD recovery by roughly four quarters. The recovery period this time—which began late last year—may even be longer. On the agricultural front, supplies are likely to be excessive, with surpluses constraining OECD import demand and prices, thus preventing LDC exports from rising. For most industrial raw materials, large OECD stockpiles, excess LDC capacity, and structural changes that reduce requirements are likely to limit OECD demand for these materials during recovery and dampen price increases. Oil exports will be hurt by the weak oil market and constant oil prices. Manufactured goods, on the other hand, represent a more stable export product, and several of these countries have increased their manufactured exports. Because of these trends, countries such as Mexico—which exports a relatively high share of manufactured goods—should do better than those such as Costa Rica, Kenya, and Morocco—which rely heavily on agricultural sales.

If lenders continue to limit Third World borrowing, we expect that an increasing number of LDCs will face difficult choices in adapting their economies to a more austere long-run export growth path than they experienced in the 1970s. We believe that the LDCs will have to limit their

imports to accommodate the slower export growth. Some of the debt-troubled LDCs—Argentina, Brazil, Chile, and Mexico—have already reduced their imports to comply with balance-of-payments criteria set in IMF programs. Import retrenchment is also likely in several other LDCs—Indonesia, Peru, the Philippines, and Venezuela—that are having difficulty coping with declining exports, capital flight, and shrinking reserves. These LDCs are important markets for the OECD, and a reduction in OECD exports could reduce OECD industrial production and, in turn, OECD economic growth and imports. We also expect the debt-troubled LDCs' export opportunities among themselves will be curtailed as their imports decline.

As the debt-troubled LDCs fail to increase export sales sufficiently to resolve their financial problems despite the OECD recovery, they could seek to remedy their situation at international bargaining tables. We anticipate that, in addition to increased aid, they will press even harder for greater market access, guaranteed market size, commodity price and export income stabilization funds, export credit guarantee facilities, and structural changes in international institutions.



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Contents

	<i>Page</i>
Key Judgments	iii
Burgeoning Debt Problems: The Role of the OECD Recession	1
OECD Recovery and LDC Export Response	2
Outlook for LDC Export Response to OECD Recovery	6
The Near-Term Outlook	6
The Longer Term Outlook	7
Implications	9

Appendix

Methodology	11
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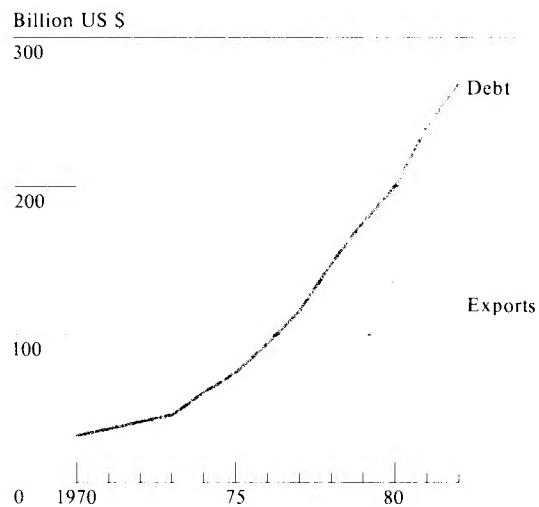
Figures

1.	Key Debt-Troubled LDCs: Trends in Debt and Export Earnings	vi
2.	Key Debt-Troubled LDCs: Destination of Exports, 1981	2
3.	Key Debt-Troubled LDCs: Commodity Composition of Exports, 1981	6
4.	Key Debt-Troubled LDCs: Projected Export Response to OECD Recovery	8

Tables

1.	Key Debt-Troubled LDCs: Changes in Total Export Earnings	1
2.	Key Debt-Troubled LDCs: Changes in Exports to the OECD	3
3.	Key Debt-Troubled LDCs: Estimated Changes in Exports to the OECD	7

Figure 1
**Key Debt-Troubled LDCs: Trends in Debt
and Export Earnings^a**



^a Medium- and long-term debt; reliable short-term debt totals are not available for years before 1979.

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Key Debt-Troubled LDCs: Export Response to OECD Recovery

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Burgeoning Debt Problems: The Role of the OECD Recesson

LDC debt problems have mounted steadily over the past three years. For 15 key debt-troubled LDCs, total debt rose from \$215 billion at the end of 1979 to \$352 billion by yearend 1982, \$268 billion of which was medium and long term.¹ A key factor in the recent inability of most of these countries to manage their debt—and, indeed, behind the buildup of the debt itself—has been the drop in their exports since 1980. Total exports of these countries fell from \$138 billion in 1980 to \$125 billion in 1982, a 10-percent decline (figure 1).²

Nearly all of these countries have experienced export declines (table 1):

- Foreign sales by Chile, Ivory Coast, Kenya, Morocco, Nigeria, Peru, the Philippines, and Zaire began falling in 1981; by the end of 1982 these countries together had lost nearly \$16 billion in export sales. For the first three months of this year, exports from these countries were 30 percent below the year-earlier level.
- Argentina, Brazil, Costa Rica, Ecuador, Indonesia, and Venezuela joined the export decline in 1982. In one year these countries together lost \$9 billion in export sales. Their exports were 15 percent lower in the first quarter of 1983 than a year earlier.

Only Mexico has not experienced a decline in total export sales; even it, however, witnessed a dramatic slowdown in export growth. Between 1978 and 1981, Mexico's exports rose at a 50-percent annual rate; since early 1982 they have increased only 15 percent.

¹ The 15 countries examined are: Argentina, Brazil, Chile, Costa Rica, Ecuador, Indonesia, Ivory Coast, Kenya, Mexico, Morocco, Nigeria, Peru, the Philippines, Venezuela, and Zaire. These countries were selected on the basis of an evaluation of their relative debt positions, considering both their level of debt, as well as their ability to service their debt.

² Historical data presented in this study were obtained from IMF statistical publications.

Table 1 Million US \$
Key Debt-Troubled LDCs:
Changes in Total Export Earnings

	Annual Average 1976-80	1981	1982
Total	17,744	-928	-12,173
Argentina	1,013	1,122	-1,520
Brazil	2,293	3,161	-3,118
Chile	655	-765	-84
Costa Rica	98	29	-158
Ecuador	304	36	-403
Indonesia	2,961	354	-2,545
Ivory Coast	391	-607	-651
Kenya	138	-206	-157
Mexico	2,533	3,813	2,197
Morocco	185	-55	-324
Nigeria	3,750	-7,015	-3,148
Peru	521	-643	-25
Philippines	689	-86	-686
Venezuela	2,052	904	-1,431
Zaire	161	-970	-120

The marked shift in export trends has been an important factor—perhaps the key factor—in the debt buildup experienced by these countries. We estimate that if their exports had continued to grow in 1981-82 at the 1976-80 rate, their total foreign sales in 1982 would have been \$50 billion higher than they were. In contrast, higher world interest rates increased their debt service payments only \$15 billion during 1981-82. Whether or not higher export revenues would have translated into lower debt or higher import levels is problematical, but, in any case, these countries' economic difficulties clearly would have been greatly alleviated.

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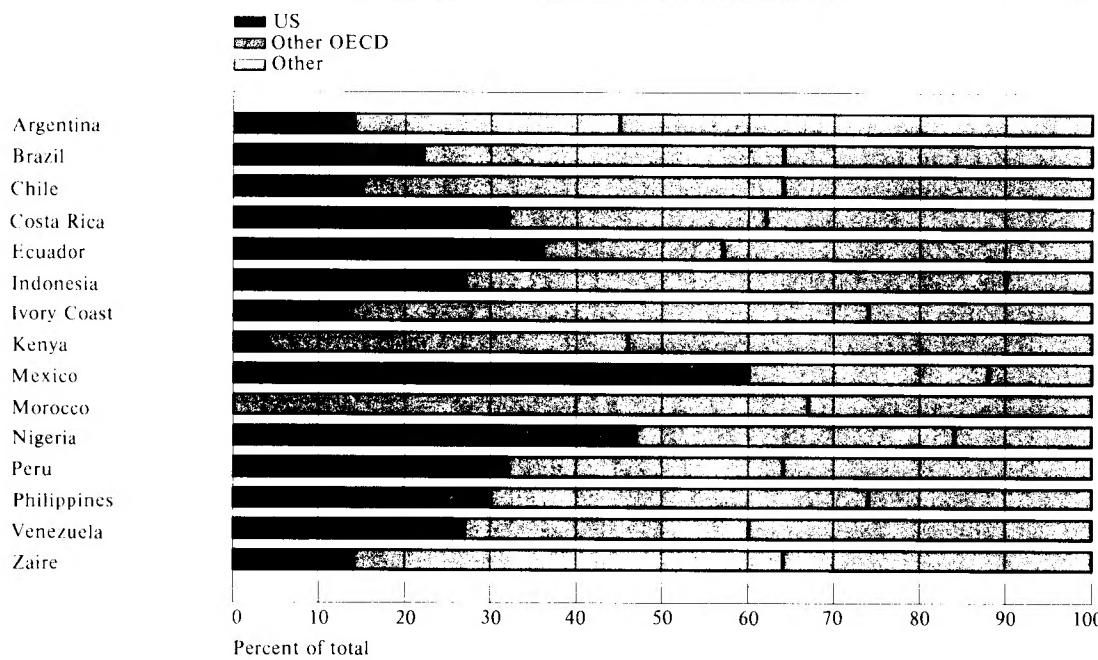
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Figure 2
Key Debt-Troubled LDCs: Destination of Exports, 1981



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The OECD recession is largely responsible for the 15 LDCs' declines in export revenues. It weakened export earnings by reducing both the volume and prices of LDC exports. Taken as a group, their export earnings from OECD sales, representing more than two-thirds of their total export earnings (figure 2), declined \$11 billion in 1981-82. In contrast, sales to the OECD had expanded at an average annual rate of \$14 billion during 1976-80.

OECD Recovery and LDC Export Response

Just as OECD recession pulls LDC exports down, rising consumption and production during OECD expansionary periods translate into rising LDC export revenues—but only after a considerable lag. This at

least has been the experience in the past. Coming out of the last recession, for example, exports to the OECD from the currently debt-troubled LDCs rose only 1 percent in value terms during the first four quarters of recovery. After three years of expansion, exports by these LDCs stood nearly 35 percent higher (table 2). Several countries fared better than the others during this recovery period, with their performances related in part to the commodity mix of exports.

In general, past patterns of supply and demand are valid for forecasting the immediate future because structural changes take years to fully affect the

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Table 2
Key Debt-Troubled LDCs:
Changes in Exports to the OECD

	1976 1st Qtr	1977 1st Qtr	1978 1st Qtr	<i>Percent^a</i>
Total	1.0	38.4	-4.1	
Argentina	12.6	61.7	8.8	
Brazil	-7.4	54.5	-8.0	
Chile	4.5	16.8	25.8	
Costa Rica	8.0	38.7	-3.1	
Ecuador	-3.9	53.0	20.7	
Indonesia	20.1	32.8	0.1	
Ivory Coast	0.1	91.6	20.3	
Kenya	-5.5	90.5	-2.6	
Mexico	19.0	33.4	19.8	
Morocco	-20.5	11.5	4.4	
Nigeria	12.8	35.5	-28.5	
Peru	-21.8	28.4	-5.0	
Philippines	-29.5	36.0	12.9	
Venezuela	-12.2	21.1	-14.8	
Zaire	-12.3	58.9	2.7	
Change in OECD real GNP	5.6	4.0	3.4	

^a Percent change from year-earlier levels.

coffee—have put downward pressure on farm commodity prices. Factors such as past investments in better farming technology, land development, and marketing infrastructure will further swell world farm production despite low prices. New land continues to be brought into production, and land is being worked more intensively. Efforts by OECD governments to protect their farm economies through domestic price supports and import quotas and to conserve foreign exchange spending on food imports encourage even greater farm surpluses.³

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As far as *raw materials* are concerned, a number of factors will moderate the rebound in export earnings:

- Large OECD stockpiles of industrial raw materials are likely to suppress demand and inhibit price increases. For example, OECD stocks of copper, aluminum, and tin amount to 80, 100, and 250 days of consumption, respectively. Rapid reductions in these inventories are unlikely as long as 30 percent of OECD industrial capacity sits idle and investment in new industrial plant and equipment is down. High interest rates and expectations of slower inflation will also discourage future stock accumulation.

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- Excess metals-producing capacity in the industrial world as well as in most of these LDCs is likely to swell metal supplies and restrain price increases. As market conditions improve, some firms that have temporarily mothballed capacity may start up production and other firms may more fully utilize production capabilities. Some of these LDCs—Brazil, Chile, Peru, and the Philippines—invested heavily in their metal-producing industries as they increased their own consumption of metals in the 1970s. Their current financial difficulties, however, will prevent them from undertaking large metal-intensive capital projects in the foreseeable future, thus further augmenting available supplies.

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market. There are, however, some factors likely to cause the effect of this economic recovery on the exports of the key debt-troubled LDCs to differ from the last recovery. In particular, agricultural and industrial commodity markets have suffered severely during this recession, and we anticipate that exports of these commodities will not recover as before. Oil exports will be constrained by the weak oil market and constant oil prices. Manufacturing trade, on the other hand, has become relatively more important, and we expect that those countries exporting manufacturers will benefit more this time.

On the *agricultural* front, surpluses are likely to constrain prices. Good harvests, depressed demand, and huge carryovers—especially for grain, cocoa, and

***OECD Recovery and the LDC Export Response:
The 1975-78 Experience***

Exports of agricultural goods from Argentina, Ivory Coast, and Kenya to the OECD rose significantly during the last recovery. Argentina's grain exports logged a record year in 1977, and increases in the prices of coffee and cocoa, the major exports of Kenya and Ivory Coast, buoyed their export sales to record levels in 1977. Costa Rica and Ecuador also benefited from higher coffee prices but overall did not fare nearly as well, primarily because bananas, for which prices did not rise, were their other major export.

Exports from Chile, Peru, and Zaire also picked up during the 1975-78 OECD recovery, rising 50 to 70 percent above 1975 lows by 1978. The volume-to-price interaction in these countries was, however, opposite that of the agricultural exporters. The price of copper—their chief export—rose only slightly, but volume growth boomed as OECD industrial production and construction activity pulled up copper demand. Zaire fared the best of these three countries, primarily because it also exported cobalt, for which there was volume growth, and coffee, the price of which rose significantly.

Exports to the OECD from the more industrialized of these 15 LDCs—Brazil, Mexico, and the Philippines—picked up less rapidly during the 1975-78 OECD recovery than did the OECD sales of most of the other countries. While manufactured exports

respond fairly strongly to the OECD business cycle, these 15 countries' exports of manufactured goods were marginal in 1975-78, and secular increases in OECD imports of manufactures had kept these exports on an upward track even during the preceding recessionary period. The increased economic activity, therefore, spurred LDC export recovery only slightly beyond the pace that prevailed in the recession years.

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Three major oil exporters—Indonesia, Nigeria, and Venezuela—saw an immediate but unsustained rise in their exports to the OECD, because the energy crisis had changed the balance between supply and demand in the world energy market and altered OECD energy consumption patterns. OECD oil use fell 3 percent during the last expansionary period despite the fact that OECD industrial production rose 19 percent and total energy consumption grew 4 percent. As a result, these three countries increased their exports to the OECD only 27 percent (\$4 billion) over the entire 1975-78 recovery period. As oil exporters, Mexico and Ecuador also faced declining OECD demand for energy, but the circumstances differed. Mexico was only beginning to emerge as an oil exporter, so volume increases boosted oil export earnings 300 percent. Ecuador, although an OPEC member, was neither dependent on oil revenues nor a significant oil exporter; foodstuffs were the major export item.

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- The linkage between raw material use and industrial country growth has steadily weakened for most metals because OECD economic activity is shifting from heavy industrial production toward services and toward consumer goods with little metal content. Technological changes have led to new production processes and product specifications, often reducing metal content. Downsizing and miniaturization have caused manufacturers to use less metal per unit. Competition with lighter, less expensive substitutes has increased the use of lower

gauge metals. Many of the substitutes, such as plastic, are not exported by the 15 LDCs.

The combination of these factors will check OECD demand for metals during recovery. This in turn will dampen price increases, further limiting revenue gains.

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***Substitution and Conservation:
The Case of Copper***

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Aluminum virtually eliminates copper in the long-distance power transmission field because of its lightness, conductivity, and usually lower cost. There has also been considerable displacement of copper by aluminum in insulated cables whenever insulation costs are low. Aluminum could soon displace copper in heat exchanger applications, particularly automobile radiators. As automotive manufacturers reduce vehicle weight to increase fuel economy, aluminum radiators offer an attractive option if technical problems such as weldability can be eliminated.

for the latter increases and technological innovations occur, prices could drop and fiber optics could replace copper in communications applications.

[redacted]

Plastic pipes and tubes have made strong inroads on copper in plumbing applications. For the most part, plastics are cheaper, lighter, and easier to work with than copper, and their use is becoming more widespread with the gradual easing of local construction codes

Improvements in the design and performance of telephone equipment have permitted the use of thinner gauge wires. Currently, the telephone systems in most countries are shifting down to 0.4-mm or 0.32-mm wire as the standard gauge, and it is estimated that by 1990 this process will have eliminated around 40 percent of the copper required in the United States for a given volume of traffic. In addition, improvements in multiplexing—the process of sending multiple conversations through a single telephone circuit—are reducing the need for additional cables.

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Another challenge comes from fiber optics. Optical fibers are technically superior to copper coaxial cables in telecommunications. Although copper is still somewhat cheaper than optical fiber, as demand

Savings in the use of copper have also been encouraged by the drive toward lightness and miniaturization. For instance, the potential widespread use of aluminum in automobile radiators has spurred copper fabricators to develop thinner gauge strip and walled tube.

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Manufactured goods, on the other hand, represent a stable export product, and manufactured exports are no longer insignificant for several of the 15 LDCs. During the 1970s exports of manufactures from these countries to OECD markets rose rapidly, from \$800 million in 1970 to almost \$12 billion in 1980, and now account for more than 10 percent of total exports to the OECD. While Brazil, Mexico, and the Philippines export 80 percent of these 15 countries' manufactures, Argentina also relies on manufactures for about 20 percent of total export earnings (figure 3).⁴ We also expect new nontraditional, high-technology export sales by the LDCs to rise, but most of their manufactured exports now are semifinished items and consumer goods. Increased protectionism in the

OECD countries would dampen OECD imports of these manufactured goods. Some of the products—textiles, apparel, and footwear—are already subject to import quotas and other restrictions.

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Five of the 15 countries are important sources of OECD oil imports: four—Ecuador, Indonesia, Nigeria, and Venezuela—are OPEC members, and the fifth is Mexico. While we believe the OECD will steadily reduce its reliance on imported oil per unit of output, this is a slow process. Constant or declining real oil prices, as exist at present, will postpone investments and delay this process. Increased economic activity and rises in energy demand should pull up OECD imports of oil, and consequently the oil-producing, troubled debtors should experience a rise in export earnings.

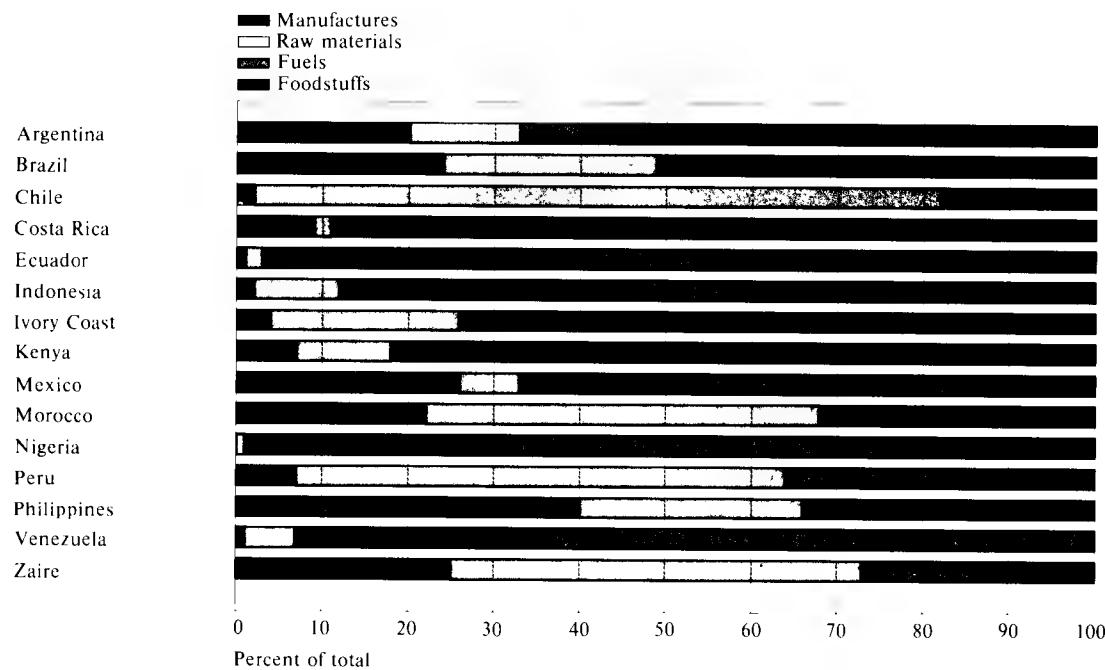
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⁴ Both Morocco and Zaire are indicated as exporting over 20 percent manufactured goods because of their semimanufactured mineral exports, phosphates and diamonds, respectively.

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Figure 3**Key Debt-Troubled LDCs: Commodity Composition of Exports, 1981**

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Outlook for LDC Export Response to OECD Recovery

The exact course of these 15 countries' exports over the next three years will depend on the strength of the OECD recovery and the effect of the recovery on their exports. To gauge the probable export-recovery paths of these countries, we looked at the historical linkage between the OECD business cycle and the exports to the OECD for each of the 15 countries. This analysis was then used, in connection with commodity market analyses, to suggest likely paths for export earnings under alternative OECD recovery scenarios.⁵

⁵ For a description of the methodology employed for linking the OECD business cycle to LDC exports and analyzing commodity market response, see appendix A.

The Near-Term Outlook

On the basis of this analysis, we believe that while LDC export sales have not yet picked up, these countries' export declines have probably tapered off. OECD-wide industrial output bottomed out in November 1982 and has risen since, but our analysis indicates that LDC exports do not rebound until roughly four quarters after OECD economic revival begins (table 3 and figure 4). If anything, the actual lag may be even longer than past experience would suggest since high interest rates, low commodity prices, and rising protectionist trends, coupled with conditions in the raw materials' markets, may dampen any export pickup in the early stages of recovery.

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Table 3
Key Debt-Troubled LDCs:
Estimated Changes in Exports to the OECD

	Average Annual Past Performance During OECD Recessions 1981-82	Average Annual Projected Performance During OECD Recovery 1983-85	Average Annual 1971-80
Average	-6.1	11.4	21.7
Argentina	-1.5	4.2	13.6
Brazil	2.5	10.8	19.3
Chile	-7.5	8.5	15.8
Costa Rica	-3.4	7.9	14.6
Ecuador	-2.2	14.3	21.2
Indonesia	-5.7	14.3	37.5
Ivory Coast	-13.3	6.7	18.5
Kenya	-12.3	10.3	20.1
Mexico	15.8	22.0	27.9
Morocco	-8.2	7.4	17.6
Nigeria	-21.2	12.4	45.3
Peru	-6.9	12.0	14.4
Philippines	-5.2	9.0	18.0
Venezuela	-5.6	15.4	25.5
Zaire	-16.6	16.8	15.5
Change in OECD real GNP	0.6	3.2	3.3

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As a result of the lagged response of LDC exports to the OECD economic turnaround, the remainder of 1983 and the first half of 1984 probably will be a difficult period for debt-troubled LDCs. Our estimates indicate that even if OECD real economic growth averages a 2.8-percent annual rate over the four quarters of 1983—a rate that would yield year-to-year OECD real growth of 2 percent—the aggregate exports of the 15 countries in 1983 will be barely higher than last year on a year-over-year basis. In this case, more than half the countries would have lower OECD sales this year than last. Argentine, Chilean, and Costa Rican exports to the OECD will likely be the slowest to recover in 1983. It is to Argentina's disadvantage that nearly 60 percent of all its exports to the OECD are foodstuffs, for which the outlook is not particularly favorable, and that only 30 percent of its exports go to the United States where the recovery may be the strongest. Nearly 90 percent of Costa Rica's exports are also foodstuffs. Copper is Chile's

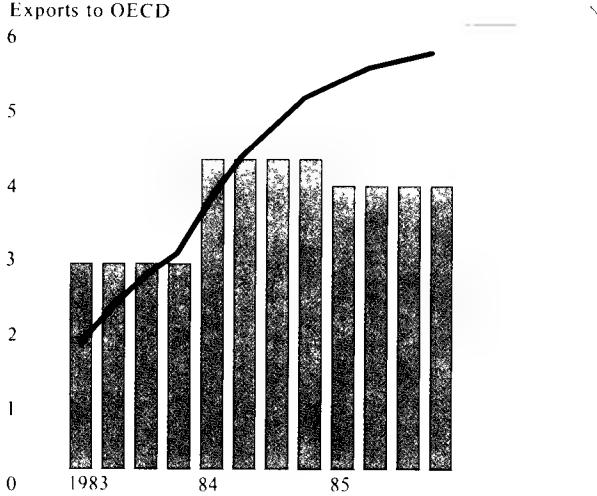
major source of export revenues and, unlike other copper exporters, Chile is experiencing falling ore grades at many mines. We expect Mexico and Venezuela to be the fastest in expanding their exports to the OECD in the near term. Nearly 65 percent of Venezuela's predominantly oil exports are destined for the United States and Canada.

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The Longer Term Outlook

If OECD economies continue to expand through 1985, the export picture of the 15 debt-troubled LDCs will begin to improve. Assuming a hypothetical OECD growth path of 3.7 percent in 1984 and 4 percent in 1985, their sales to the OECD are likely to expand \$40 billion by the end of 1985, a 40-percent increase over the 1982 export low of \$102 billion and

Figure 4
Key Debt-Troubled LDCs: Projected Export Response to OECD Recovery^a
 Percent change from previous quarter



Under this scenario we expect Mexico to do the best of the 15 debt-troubled countries over the 1984-85 period. Its relatively high share of manufactured exports, which we believe will do best in this recovery, and its large share of exports destined for US markets will benefit its export sales, as will its rising oil-production capabilities. Mexican exporters should also benefit from the depreciation of the peso vis-a-vis the dollar. A healthy performance, however, depends on the exporters' ability to get the foreign inputs needed for production. On the other hand, we believe Costa Rica, Ivory Coast, and Kenya will do the least well of these 15 LDCs. They rely on agricultural products for

a significant percent of export earnings, and we do not anticipate that agricultural prices will rise as they did during the last recovery. Expanded plantings and excessive stocks may even perpetuate the existing depressed prices into 1985.

We believe that at best the export recovery will not be strong enough to put the debt-troubled LDCs back on their prerecession growth path. Even under the relatively optimistic assumptions of a trouble-free OECD recovery and a historically typical export response, the average annual growth of nearly 16 percent in exports projected for these countries for 1984-85 will be well below the 22-percent average they experienced during the 1970s (table 3). Chile, Peru, and Zaire, however, could attain export growth in 1984-85 comparable to that which occurred in 1971-80. These countries will benefit if copper prices rebound as construction and industrial activity increases. Chile's recent investments at major copper mines and smelters will not help its initial export recovery, but may accelerate the pace of export growth in 1984-85. The medium-term export potential of the three major oil exporters—Indonesia, Nigeria, and Venezuela—will depend heavily on conditions in the oil market. At best, oil prices will remain stable over the next few years. Prices, of course, could easily nosedive if Iran and Iraq attempt to reenter the market in a large way—a possibility that is not unlikely over this three-year period. Under these conditions Mexico and Ecuador would also suffer.

A recovery stronger than expected would be necessary to help many of these LDCs get back on their prerecession export growth path. It would take, for example, OECD growth of 3.5 percent in 1983, 5.2 percent in 1984, and 5.4 percent in 1985 for these LDCs, as a group, to achieve the rapid export growth in 1984-85 that they experienced during past expansionary periods. Generally, for each 0.5-percent increase in annual OECD growth during 1983-85, these LDCs' exports to the OECD should increase another \$20 billion by the end of 1985—adding roughly 2 percentage points to the average annual rate of export growth in 1984-85. To the extent that OECD

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growth is lower—on the order of 2 percent—in 1983, reaching such export performance would require more rapid growth—about 6 percent a year in both 1984 and 1985. In the past decade, the strongest back-to-back annual performance has reached only a little more than 4 percent a year.

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Implications

If, as we expect, the debt-troubled LDCs are unable to achieve the pace of export growth sustained in the 1970s and if, as also seems likely, they are unable to increase their debt as rapidly as they did in the 1970s, then the rate at which they expand their imports must also suffer. For example, between 1975 and 1980, Brazilian imports increased 14 percent a year. Average annual increases in debt of nearly 23 percent and in exports to the OECD of 18 percent over the same period funded this import growth. Under our baseline growth path, Brazil will achieve less than 15 percent a year growth in exports during 1983-85. This will occur at a time when new borrowings are likely to be extremely limited.

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Lower import growth could increase the domestic strains on these 15 economies on two fronts. On the one hand, the reduced ability to import could lead to fewer consumer goods, slower rises in living standards, and potential civil unrest. On the other hand, the reduced import ability could lead to fewer imports of capital goods and, in turn, to a smaller economic growth potential later in the decade. In either case, these countries are going to face difficult choices in adapting their economies to a more austere long-run growth path than they were accustomed to in the 1970s.

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A reduction in the debt-troubled LDCs' imports could also slow the pace of the OECD recovery and further limit other LDCs' export expansion.⁶ Some of the debt-troubled LDCs—Argentina, Brazil, Chile, and Mexico—have already reduced their imports to comply with balance-of-payments criteria set in IMF

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programs.⁷ Import retrenchment is also likely in several other LDCs—Indonesia, Peru, the Philippines, and Venezuela—that are having difficulty coping with declining exports, capital flight, and shrinking reserves. These LDCs are important markets for the OECD, and a reduction in OECD exports could reduce OECD industrial production and, in turn, OECD economic growth and imports. We also expect the debt-troubled LDCs' export opportunities among each other will be curtailed as their imports decline.

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If the debt-troubled LDCs fail to increase export sales sufficiently to resolve their financial problems despite the OECD recovery, they could seek to remedy their situation at international bargaining tables. Attempts to redress problems through discussions rather than the marketplace are nothing new for the LDCs. The LDCs' principal goal at this summer's UNCTAD meeting, for example, was the adoption of measures that would raise and stabilize commodity prices and export earnings. We anticipate that pressures for such solutions will only build as the LDCs maneuver for greater market access, guaranteed market size, commodity price and export income stabilization funds, export credit guarantee facilities, and structural changes in international institutions.

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Appendix

Methodology

In the past many LDCs, including those that are at present financially troubled, have relied heavily on export sales to OECD markets. Generally, the value of these LDCs' exports to the OECD has paralleled the pace of OECD economic activity, rising during expansionary periods and falling during recessionary periods. During the 1970s, for example, it rose sharply in the 1972-73 boom, fell in the 1974-75 recession, and then recovered in the 1976-79 expansion.

To gauge the probable export-recovery paths of the debt-troubled LDCs, we linked the level of OECD economic activity and the LDCs' exports to the OECD, and examined the historical lag structure.¹ As our primary analysis, we examined the impact of OECD real GNP on the aggregate exports of each country. For additional commodity detail, we also examined the impact of OECD economic activity, as well as prices, exchange rates, and interest rates, on LDC exports of agricultural products, industrial raw materials, manufactures, and fuels. Quarterly data were used in the country-specific analyses, and annual data in the commodity-specific analyses.

¹ The choice of the methodology employed in the study was a difficult one—involving trade-offs among timeliness, data availability, model complexity, and desired forecast precision. We do not believe that the methodology is without faults; however, we are confident that the results are meaningful enough that we can draw some quantitative conclusions about the timing, direction, and magnitude of LDC exports if this recovery resembles the last. The intent of the study was to examine the relationship between OECD economic expansion and the debt-troubled LDCs' exports to the OECD. While we realized that a variety of factors would affect these flows, we were primarily interested in their response to an OECD recovery. Consequently, instead of trying to identify numerous variables and correctly specify their relationships among one another within a complex model, we chose to look at only OECD real GNP. Therefore, by default, we assumed that to the extent that LDC exports were linked with the OECD business cycle in the past, the relationship would also foreshadow the changes in the future. Ideally, we would have liked to have estimated export volume as a function of real GNP and then combined an estimate of export volume and an estimate of export prices to generate an estimate of export value. However, we were unable to find acceptable export prices that we could use to convert nominal exports to export volume. Many of the countries examined in the study do not have overall export price deflators; none has a deflator for goods exported to the OECD only. We opted to assume that OECD real GNP could explain both the change in export volume and export prices. Basically, we assumed that inflation during this recovery would be similar to inflation during the last recovery and affect export prices, and thus values, similarly.

For the quarterly, country-specific analysis, we assumed that LDC exports to the OECD were a function of present and lagged OECD real GNP. We also assumed that the impact of lagged OECD real GNP declined geometrically with time.² Reflecting this assumption, we estimated a standard Koyck specification. Where the results indicated, we adjusted for serial correlation.

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For the annual, commodity-specific analysis, we assumed that LDC commodity exports to the OECD were a function of OECD real GNP, exchange rates, interest rates, and prices. To capture short-run movements, we analyzed the deviations in these variables from their long-run trend levels. Commodity exports were then estimated by ordinary least squares regression techniques, and the commodity-specific analysis underpinned the differences we found in the individual country responses. LDC exports of manufactured goods, industrial raw materials, and fuels all responded strongly to changes in OECD real GNP, while exports of agricultural products did not.³

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In the country-specific analysis, we found that the model specification fit well and tracked historical data, limiting increases around turning points. Except for Argentina's and Zaire's exports, the variation in

² We estimated a variety of lag structures, expecting that some amount of time would elapse between a movement in OECD real GNP and the response of LDC exports. We estimated the lags individually up to eight quarters, and we combined up to eight lags. We also considered the distributed lag where a series of lags accounted for the time adjustment process and estimated both polynomial and geometric distributed lags. With the polynomial distributed lag, we tried constraining earlier periods to zero, later periods to zero, and both time periods to zero. For all of the equations involving lags, serial correlation was indicated so we adjusted accordingly. Nonetheless, the regression statistics were not good except for those equations involving the geometric distributed lag, estimated according to the Koyck specification. On this basis, we chose to use the Koyck specification in our final analysis.

³ Further detail describing the estimation procedure and individual regression results is available from the author.

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GNP explained 90 to 99 percent of the total variation in each country's exports to the OECD. Both Argentina and Zaire export a significant amount of food-stuffs, and we did not expect the changes in OECD GNP to explain their export changes. Nonetheless, OECD GNP regressed against exports to the OECD, for both of these countries explained a significant proportion of the change in exports—65 percent for Argentina and 87 percent for Zaire. [redacted]

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